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CLAIMS

[Claim(s)]

[Claim 1]It has an electronic image sensor which carries out photoelectric conversion of the object image, and generates a picture signal at the time of photographic subject photography characterized by comprising the following, An imaging means provided with a picture signal processing capability which changes into digital image data a picture signal generated with this electronic image sensor, A nonvolatile memory measure which memorizes image data generated by said imaging means, Radio between a wireless communication means which carries out communication transmission of the various data based on radio between a displaying means which displays a picturized object image and a picture set up beforehand, and an external storage which has a memory storage function and a transmitting function of various data of various data, and said external storage.

A judging means which judges whether existence of a communication error was detected and radio transmission of image data was completed based on the detection result concerned.

A means to control to eliminate image data judged as having carried out radio transmission by said wireless communication means at said external storage, and radio transmission having been completed by said judging means from said memory measure.

[Claim 2]The electronic imaging camera according to claim 1, wherein said control means displays a picture set up beforehand on said displaying means while forbidding elimination of image data which radio transmission is not carried out or radio transmission has not completed.

[Claim 3]The electronic imaging camera according to claim 2, wherein said picture set up beforehand is a picture for notifying of information on prohibition on elimination, or radio transmission failure at least.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the electronic imaging camera which enables radio transmission of the image data by which image pick-up memory was carried out with the electronic imaging camera to external memory storage.

[0002]

[Description of the Prior Art]After the conventional electronic imaging camera changes into predetermined compression compressed data the picture signal which carried out image pick-up generation with the electronic image sensor, it is memorized to the semiconductor storage cell arranged inside a camera.

[0003]

[Problem(s) to be Solved by the Invention]However, there is a limit in memory of image data in view of the storage capacity of a semiconductor storage cell.

[0004]This invention carries out wireless transfer of the electronic image data memorized by the memory measure of the electronic camera from the electronic camera to the external storage in view of the above-mentioned technical problem, Or it aims at providing the electronic imaging camera which can change the storage capacity of a memory measure into the state of being generous in the electronic imaging camera which electronic image data transmits from an external storage.

[0005]

[Means for Solving the Problem]The 1st electronic imaging camera of this invention is provided with the following.

An imaging means provided with a picture signal processing capability which changes into digital image data a picture signal which has an electronic image sensor which carries out photoelectric conversion of the object image, and generates a picture signal at the time of photographic subject photography, and was generated with this electronic image sensor.

A nonvolatile memory measure which memorizes image data generated by said imaging means.

Between a displaying means which displays a picturized object image and a picture set up beforehand, and an external storage which has a memory storage function and a transmitting function of various data of various data, In radio between a wireless communication means which carries out communication transmission of the various data based on radio, and said external storage, A judging means which judges whether existence of a communication error was detected and radio transmission of image data was completed based on the detection result concerned, A means to control to eliminate image data judged as having carried out radio transmission by said wireless communication means at said external storage, and radio transmission having been completed by said judging means from said memory measure.

[0006]In an electronic imaging camera of the above 1st, the 2nd electronic imaging camera of this invention displays a picture set up beforehand on said displaying means while forbidding elimination of image data which radio transmission of said control means is not carried out, or radio transmission has not completed.

[0007]The 3rd electronic imaging camera of this invention is characterized by said picture set up beforehand being a picture for notifying of information on prohibition on elimination, or radio transmission failure at least in an electronic imaging camera of the above 2nd.

[0008]

[Embodiment of the Invention]Hereafter, with reference to drawings, an embodiment of the invention is described in detail. Drawing 1 is a block diagram showing the composition of the 1 embodiment of the electronic imaging camera concerning this invention, drawing 2 is a flow chart explaining the imaging

operation of the electronic imaging camera which this invention requires, and drawing 3 is a flow chart explaining transmission operation of the electronic image data of the electronic imaging camera concerning this invention.

[0009]The fixed image sensor which the electronic imaging camera of this invention carries out photoelectric conversion of the object light, and generates an analog picture signal, The analog picture signal generated with this solid state image pickup device is changed into a digital image signal, And the microprocessor which is a control means which carries out drive controlling of the imaging means 1 which has a picture signal processing capability which carries out conversion generation of the digital image signal at predetermined compressed image data, said imaging means 1, and various means to mention later. (CPU is called hereafter) drive controlling being carried out by 2 and said CPU2, and, Drive controlling is carried out by the displaying means 3 generated by the liquid crystal element which displays an image pick based on the image data generated by said imaging means 1, and said CPU2, And the memory measure 4 of the non volatile semiconductor memory which memorizes the image data generated by said imaging means 1, and said CPU2 are received, Various drive controlling directions. The input means 5 which consists of a switch to perform, the first wireless communication means 6 that carries out radio transmission of the image data memorized by said memory measure 4 by the basis of the drive controlling of said CPU2 and said imaging means 1, CPU2, the displaying means 3, and the first wireless communication means 6. It consists of the power means 7 which supplies the power supply to drive.

[0010]Wireless connection of this electronic imaging camera is carried out to said first wireless communication means 6 and an external memory means 8 to have the second wireless communication means 9 in which radio is possible.

[0011]The release switch which said input means 5 drives said imaging means 1, and directs a photographic subject image pick-up, the object light incorporation which is provided in said imaging means 1 and which is not illustrated — making the main part of an electronic imaging camera collapse, or letting out the lens of a photographing optical system [like] to the wide angle end position which can be picturized from a collapsing position, and it being controlled, and. The electric power switch which current supply turns on and off from said power means 7 in the imaging means 1, CPU2, the displaying means 3, and the first wireless communication means 6, It is the external memory means 8 from the image data automatic transmitting switch of image data etc. which carry out transmission directions via the zoom switch which carries out the zooming drive of said photographing optical system, and said 1st wireless communication means 6.

[0012]Even when a cell is used for said power means 7 and the electric power switch of said input means 5 is turned off, the firm gas of the driving source is carried out to said CPU2 and the first wireless communication means 6.

[0013]Said first wireless communication means 6 and the second wireless communication means 9, A cellular phone, PDA (Personal Digital Assistants), It is the wireless communication system which adopted Bluetooth (registered trademark) which is the short-distance-radio communication method set up in the Bluetooth standardization organization which connects between various digital equipment, such as a notebook sized personal computer, a digital camera, and a printer.

[0014]Said external memory means is provided with various personal computers including a notebook sized personal computer, and the second wireless communication means 9 that are PDA etc. and by which said Bluetooth (registered trademark) was adopted as these personal computers and PDA. Said second wireless communication means 9 is a cellular phone corresponding to Bluetooth (registered trademark), and it may be made to carry out data communications to said personal computer, PDA, etc. via the cellular phone.

[0015]The image pick-up exposure operation of the electronic imaging camera of such composition and imaging operation, such as memory of image pick data, are explained using drawing 2.

[0016]If one [the electric power switch which is not illustrating said input means 5], a driving source will be supplied to said imaging means 1, CPU2, the displaying means 3, and the first wireless communication means 6 from said power means 7 at Step S1, and. Said CPU2 is a basis of the input of said power switch close, lets out and carries out drive controlling of the photographing optical system which is not illustrated to the wide angle end position which can be photoed from the collapsing position of the main part of an electronic imaging camera, and performs initializing operation changed into the state which can picturize an electronic imaging camera.

[0017]After the initializing operation of this step S1 is completed, at Step S2, CPU2 starts the timer function which is built in CPU2 and which is not illustrated, and it measures lapsed time. When a certain operation switch of said input means 5 is not carried out between predetermined time after a timer start, in order to save electricity in the driving source supplied from said power means 7, this timer, If an

electronic imaging camera is set as the power-saving mode and a certain switch of said input means 5 is operated, it will be considered as the standby state which enables the return of an electronic imaging camera to a photographing possible state promptly.

[0018]After the timer start of said step S2 is completed, said CPU2, So that the charging charge of the power source capacitor for strobe lights which is not illustrated may be checked, When the charge check function which is not illustrated is made to drive and the charging charge of said charging capacitor is less than a predetermined electric charge by the charge check function as a result of a check, the charging function which is not illustrated is made to drive and charging operation is performed.

[0019]When said charging capacitor is charged by the predetermined value by the drive of a charging function at said step S3 when the charging charge of a charging capacitor is a predetermined value or, by step S4. Said CPU2 judges whether zoom-in or the down switch which is formed in said input means 5 and which is not illustrated was operated.

[0020]If judged with zoom-in or a down switch having been operated by said step S4, said CPU2 carries out drive controlling of the zooming drive function which is not illustrated, will be Step S5, and will zoom in or down drive said photographing optical system. That is, when one [a zooming drive function is made to drive so that it may let out said photographing optical system to a tele edge side direction from the wide angle end side, if one / a zoom-in switch / and / a zoom down switch], a zooming drive function is made to drive so that said photographing optical system may be rounded to a wide angle end side direction from the tele edge side.

[0021]After the zooming drive of said step S5 is completed when judged with neither zoom-in nor a down switch being operated by said step S4 or, one [the release switch of said input means 5] is judged at Step S6.

[0022]this release switch — a two-step time — the one [it is an operational switch, and / are one / a half pressed state / the 1st release switch (1R) /, and / the 2nd release switch (2R)] in the state of full press. If one [the 1st release switch (1R) of this half pressed state], CPU2 will carry out drive controlling of the light measurement function which measures the photographic subject luminosity which is not illustrated, and the ranging function which measures the distance to a photographic subject. When one [the 2nd release switch (2R) of a full-press state], CPU2, By the focus control of the photographing optical system which is not illustrated by the basis of said ranging result, and the basis of said photometry result, diaphragm value setting out of said photographing optical system, And setting out at the time of the electronic shutter second of the image sensor of said imaging means 1 is performed, and the electronic image signal of an object image and the generation drive of image data which made drive said imaging means 1 and said image sensor was made to expose are performed.

[0023]If judged with one [the 1st release switch (1R)] by said step S4, at Step S7, CPU2 will make the light measurement function which is not illustrated drive, and it will carry out the measurement drive of the photographic subject luminosity. A publicly known light measurement instrumentation method is used, and a light measurement function has the method of calculating a luminance value from the object image signal by which exposure photoelectric conversion was carried out with the image sensor of said imaging means 1, and a method of calculating a photographic subject luminance value based on the photoelectric current produced by the object light which entered into the photometry element.

[0024]After light measurement operation of said step S7 is completed, at Step S8, CPU2 makes the publicly known ranging function which measures the distance to the photographic subject which is not illustrated drive, and it performs distance measurement to a photographic subject. A publicly known ranging measurement method is mainly concerned with a ranging function, and the triangulation method is used.

[0025]There are a passive system and an active system in this triangulation method, and separation light-receiving of the light from a photographic subject is carried out, and a passive system has a line sensor of a couple changed into each object image signal, and is constituted. When the luminosity and contrast of a photographic subject are low, it may have sources of a fill-in flash, such as a stroboscope which irradiates with the illumination light towards the photographic subject concerned.

[0026]The above-mentioned active system has an infrared light emitting device which floodlights an infrared beam towards a photographic subject, and a position detecting element which receives the catoptric light from the photographic subject in which it was allocated with this infrared light emitting device and base length, and the infrared beam was irradiated, and is constituted.

[0027]After ranging by triangulation, such as a high Brit method which combined either of above-mentioned passive systems and active systems or both methods, is completed at said step S8, CPU2 judges one [the 2nd release switch (2R)] by step S9. If judged with the 2nd release switch (2R) being off, CPU2 is Step S10, it will judge one [the 1st release switch (1R)] again, will return that it is one to

said step S9, and will perform the one judging of the 2nd release switch (2R) again. If judged with the 1st release (1R) being off, Step S17 or subsequent ones will be performed.

[0028]If judged with the 2nd release switch (2R) being one in said step S9, it will be Step S11, and said CPU2 is a basis of the distance measurement value measured at said step S8, it will make the focus control function of the photographing optical system which is not illustrated drive, and will adjust a photographing optical system to a focal position.

[0029]Next, it is a basis of the photometry value which CPU2 carried out drive controlling of said imaging means 1 at Step S12, and measured the strength of the light at said step S7, Drive controlling of the exposure time of the image sensor of said imaging means 1, i.e., the electronic shutter, is carried out, photoelectric conversion of the object image exposed to the image sensor is carried out, and an analog object image signal is generated. By the photometry result of said step S7, when judged with a photographic subject being dark, a strobe light is carried out, strobe illumination of the photographic subject may be carried out, and it may be exposed. This analog object image signal is changed into a digital object image signal, and it changes into predetermined compression digital image data. As for this compression digital image data, the JPEG system of the compression technology of a picture signal, etc. are used.

[0030]After the imaging operation of said step S12 is completed, at Step S13, based on the compression digital image data generated by said imaging means 1, said CPU2 is changed into a digital image signal, supplies the digital image signal to said displaying means 3, and displays the picture of an image pick-up object image.

[0031]The picture of the image pick-up object image in said displaying means 3 of this step S13 is displayed, and the internal timer of said CPU2 is started and the measurement start of the image display time of onset in said displaying means 3 is performed.

[0032]If the image display by the displaying means 3 of said step S13 is started, CPU2 will perform control which carries out storage of the digital compressed image data generated by said imaging means 1 to said memory measure 4 at Step S14. When [both] making image data memorize to this memory measure 4, code data, such as elimination of the address information of the image data storage within the memory measure 4 and the memorized image data or an elimination failure, are memorized.

[0033]After memory of the image data to the memory measure 4 of said step S14 is completed, at Step S15 CPU2, The lapsed time of the timer started when displaying an image pick on the displaying means 3 at said step S13 is judged, When display time is judged and the display of the image pick of said displaying means 3 carries out specified time elapse until the display of the image pick displayed on said displaying means 3 carries out specified time elapse, at Step S16. CPU2 performs control which stops the display driving of the image pick in said displaying means 3, and Step S17 or subsequent ones is performed.

[0034]At said step S6 or Step S10, it is judged with the 1st release switch (1R) being off, or, Or after terminating the display of the image pick in said displaying means 3 at said step S16, CPU2 judges whether said electric power switch is an ON state at the time of initialization of said step S1 at Step S17. When the ON state of the electric power switch of this step S17 is checked, at Step S18 CPU2, When specified time elapse of whether the predetermined time presetted after carrying out a timer start at said step S2 has passed has not been judged and carried out, it returns to Step S3, a strobe charging check or subsequent ones is performed again, and imaging operation of the photographic subject image pick-up performed continuously is performed.

[0035]If judged with the predetermined time which was judged as an electric power switch being off at said step S17, or was presetted from the timer start at said step S18 having passed, CPU2 will perform end processing of an electronic imaging camera at Step S19.

[0036]End processing of this step S19 rounds said photographing optical system to a collapsing position, and controls said power means 7, The driving source supply to said imaging means 1 and the displaying means 3 is suspended, and only read-out of the image data memorized by said memory measure 4 by said CPU2 at least and current supply which drives the function to transmit the read image data to the external memory means 8 using said 1st wireless communication means 6 are performed.

[0037]After end processing of said step S19 is completed, CPU2 performs the on/off state judging of the automatic transmission configuration switch which is formed in said input means 5 which sets whether automatic transmission is performed to the external memory means 8 of the image data memorized by said memory measure 4 and which is not illustrated at Step S20.

[0038]Automatic transmission of image data as said automatic transmission configuration switch is the one to perform at Step S21. CPU2 reads the image data memorized by said memory measure 4, carries out drive controlling of said 1st wireless communication means 6, performs the 2nd wireless communication means 9 and radio of said external memory means 8, and performs transfer operation of

image data. Detailed operation of the transfer operation of the image data of this step S21 is mentioned later.

[0039]After judging that said automatic transmission configuration switch is the OFF which does not transmit image data automatically at said step S20 or completing automatic transmission of the image data of said step S21, said electronic imaging camera is changed into a Halt (stop) state at Step S22.

[0040]Said 1st wireless communication means 6 of this Halt state is ability ready for receiving about the image-data-transfer requirement signal from said 2nd wireless communication means 9, And when an image-data-transfer requirement signal is received from said 2nd wireless communication means 9, it is a standby state which can return to the operation which said CPU2 reads image data from said memory measure 4, and carries out drive controlling of said 1st wireless communication means 6, and makes image data transmit.

[0041]In the state of Halt of said step S22, said external memory means 8 makes the 2nd wireless communication means 9 drive, and transmits an image-data-transfer requirement signal, and said 1st wireless communication means 6 receives an image-data-transfer requirement signal, When the receipt information is transmitted by said CPU2, at Step S23 said CPU2, When it is judged whether said 1st wireless communication means 6 received said image-data-transfer demand and it judges with having received said image-data-transfer signal, at Step S24. If judged with their being whether CPU2 is one which the automatic transmission configuration switch of said input means 5 transmits automatically, and the one judged and transmitted automatically, it will return to said step S21, and image-data-transfer operation will be performed.

[0042]If CPU2 is judged as the image-data-transfer requirement signal from said 2nd wireless communication means 9 not being received at said step S23, It will return to said step S1, will be in the photography improper state where the electric power switch of the electronic imaging camera was turned off, and will be in the standby state of initialization of Step S1.

[0043]At said step S24, if judged with it being the OFF when said automatic transmission configuration switch does not transmit automatically by CPU2, it will return to said step S22, and will be set as a Halt state.

[0044]That is, are one [the electric power switch of an electronic imaging camera], an electronic image pick-up is carried out by the imaging means 1 according to operation of an electronic image pick-up of Steps S1-S16, and imaging operation ends the image data which the electronic image pick-up was carried out and was memorized by the memory measure 4, If one [the electric power switch of an electronic imaging camera serves as OFF and / the automatic transmission switch of image data], The image data by which the electronic image pick-up was carried out uses the 1st wireless communication means 6 for the external memory means 8 from an electronic imaging camera automatically, and carries out radio transmission between the 2nd wireless communication means 9 of said external memory means 8. Transmission was made possible by the image-data-transfer demand from the external memory means 8 after the power supply switch off of an electronic imaging camera.

[0045]Next, detailed operation of the image data transfer of said step S21 is explained using drawing 3. If judged with CPU2 confirming whether non-transfer image data is memorized by said memory measure 4 at Step S25, and there being no non-transfer image data, Halt of said step S22 or subsequent ones is performed via a return, and if judged with there being non-transfer image data, said 1st wireless communication means 6 would receive the image-data-transfer requirement signal from the 2nd wireless communication means 9 of said external memory means 8 at Step S26, or it will be judged by CPU2.

[0046]When judged with said 1st wireless communication means 6 not having received the image-data-transfer requirement signal from said 2nd wireless communication means 9 at said step S26, it is Step S27, CPU2 considers the 1st wireless communication means 6 as a master, and image data transfer of the image data memorized by said memory measure 4 is carried out to said external memory means 8 via said 2nd wireless communication means 9 — a preparation drive being carried out and, Said 1st wireless communication means 8 is made to drive at Step S28, and the requirement signal for carrying out radio to said 2nd wireless communication means 9 is sent.

[0047]If the 2nd wireless communication means 9 receives an image-data-transfer requirement signal from said 1st wireless communication means 6, As opposed to the image-data-transfer requirement signal received by this 2nd wireless communication means 9, Image-data-transfer acceptance is possible for said external memory means 8, or whether it is [acceptance] ready judges, and that image data acceptance is possible said external memory means 8, Drive controlling of the 2nd wireless communication means 9 is carried out, and an image data acceptance reply signal is outputted to said 1st wireless communication means 6.

[0048]To the image data transmission request from the 1st wireless communication means 6 of said step S28, at said step S29. By the basis of the drive controlling of said external memory means 8, the

image data acceptable reply signal was outputted from the 2nd wireless communication means 9, and it received by said 1st wireless communication means 6, or judges by said CPU2.

[0049]If said step S22 or subsequent ones will be performed via a return if judged with there being no response of transmission acceptance of the image data from said external memory means 8, and there is a response of transmission acceptance of image data at this step S29, Step S31 or subsequent ones will be performed.

[0050]When judged with said 1st wireless communication means 6 having received the image-data-transfer requirement signal from said 2nd wireless communication means 9 at said step S26, it is Step S30, CPU2 performs the preparation drive which carries out image data transfer of the image data memorized by said memory measure 4 to said external memory means 8 via said 2nd wireless communication means 9 by the demand of said external memory means 8 by making the 1st wireless communication means 6 into a slave.

[0051]That is, said 1st and 2nd radio ***** 6 and 9 is adopting Bluetooth (registered trademark), and it enables each to become a master and a slave.

[0052]At said step S29, from said external memory means 8, there is an acceptance response of image data and at said step S30. After image-data-transfer preparation is completed by the image-data-transfer demand from said external memory means 8, at Step S31. CPU2 reads the non-transfer image data of said memory measure 4, carries out drive controlling of said 1st wireless communication means 6, and carries out radio transmission of said non-transfer image data to the 2nd wireless communication means 9 as a radio signal of Bluetooth (registered trademark) specification, and the external memory means 8 is made to memorize it.

[0053]Next, it is judged at Step S32 whether CPU2 has the non-transfer image data transfer communication error which carried out radio transmission at said step S31. If judged with there being a radio error at this step S32, at Step S34, CPU2 will carry out drive controlling of said 1st wireless communication means 6, and it will carry out re transfer communication of the image data which the transmission communication error produced.

[0054]There is no transmission communication error of image data which carried out re transfer communication at said step S34, or it re-judges at Step S35 CPU2. If judged with there being a transmission communication error again by the judgment of a transmission communication error of this step S35, CPU2 will set an elimination prohibition alarm display etc. as elimination prohibition setting out or said displaying means 3 from said memory measure 4 of the image data which the transmission communication error produced at Step S36.

[0055]When judged with there being no transmission communication error, by the transmission communication error judging of said steps S32 and S35 at Step S33. CPU2 makes setting out of the prohibition on elimination from said memory measure 4, or an elimination prohibition alarm display cancel the image data by which is memorized by said memory measure 4 and transmission communication was carried out at said steps S31 and S34.

[0056]Next, it is judged at Step S37 whether automatic deletion is possible for CPU2 for every image data memorized by said memory measure 4. Setting out of the prohibition on elimination, an elimination prohibition alarm display, etc. is canceled at said step S33, automatic deletion is effective, or the prohibition on elimination or an elimination prohibition alarm display is set up at said step S36, and the judgment of this automatic deletion is whether to repeal automatic deletion.

[0057]If judged with it being automatic deletion validity at said step S37, CPU2 will be memorized by said memory measure 4 at Step S38, And transmission communication is carried out at said step S31 or S34, it is judged with there being no transmission communication error at said step S32 or S35, and the image data of which setting out of the prohibition on elimination or an elimination prohibition alarm display was canceled at said step S33 is eliminated further.

[0058]If judged with it being automatic deletion invalidity at said step S37, said memory measure 4 will memorize, And carry out transmission communication at said step S31 or S34, it is judged with the transmission communication error having arisen at said step S32 or S35, and the image data to which the prohibition on elimination or an elimination prohibition alarm display was set at said step S36 is not made to eliminate further, but it is made to remain.

[0059]It is judged with automatic deletion invalidity at said step S37, or is judged with automatic deletion validity, and after elimination of the image data to which automatic deletion was permitted at Step S38 is completed, Halt of said step S22 or subsequent ones is performed via a return.

[0060]That is, if said electronic imaging camera ends photographing operation and the electric power switch of the input means 5 is turned off, from the power means 7, drive operation of the driving source will be supplied and carried out only to CPU2 and the 1st wireless communication means 6. When turned off [of this electric power switch], CPU2 is image pick data memorized by the memory measure 4,

Image data which is not transmitted to the external memory means 8 (namely, at the time of the past image data transfer.) If it judges and there is non-transfer image data, whether a transfer error arises and there are photographed image data which is not eliminated and newly memorized image data, CPU2 performs an image-data-transfer demand to the external memory means 8, and if transmission acceptance permission is obtained from the external memory means 8, it will perform transmission communication for the non-transfer image data in which the memory measure 4 is memorized.

[0061]It is in the power supply switch off state of an electronic imaging camera, and if there is an image-data-transfer demand from the external memory means 8 when the memory measure 4 has non-transfer image data, CPU2 of an electronic imaging camera will carry out transmission communication of the non-transfer image data memorized by the memory measure 4 to the external memory means 8.

[0062]Thus, the image data by which transmission communication was carried out to the external memory means 8 is carrying out automatic deletion from the memory measure 4, and the memory of new image data of it is attained at the memory measure 4.

[0063]In the case of the cellular phone of the Bluetooth (registered trademark) correspondence by the external memory means 8, or PDA, It is also possible to connect the 1st wireless communication means 6, said cellular phone, or PDA of an electronic imaging camera, and to perform image data transfer in a personal computer via the cellular phone and PDA.

[0064]

[Effect of the Invention]According to the electronic imaging camera of this invention, can carry out radio transmission of the image data memorized by the memory measure at an external storage using a wireless communication means, and the electronic image data which carried out radio transmission by eliminating from a memory measure, It becomes possible to change the storage capacity of a memory measure into the state of being generous, and the miniaturization of an electronic camera can be maintained.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the composition of the 1 embodiment of the electronic imaging camera concerning this invention.

[Drawing 2] The flow chart explaining the imaging operation of the electronic imaging camera which requires this invention.

[Drawing 3] The flow chart explaining transmission operation of the electronic image data of the electronic imaging camera concerning this invention.

[Description of Notations]

- 1 — Imaging means
- 2 — Microprocessor (CPU)
- 3 — Displaying means
- 4 — Memory measure
- 5 — Input means
- 6 — The 1st wireless communication means
- 7 — Power means
- 8 — External memory means
- 9 — The 2nd wireless communication means

[Translation done.]

光した被写体像を光電変換して、アナログ被写体像信号を生成する。なお、前記ステップS7の測光結果で、被写体が暗いと判定された場合は、ストロボ発光させて被写体をストロボで照明して露光することもある。このアナログ被写体像信号をデジタル被写体像信号に変換し、かつ、所定の圧縮デジタル画像データに変換する。この圧縮デジタル画像データは、画像信号の圧縮方式のJPEG方式等が用いられる。

【0030】前記ステップS12の撮像動作が終了すると、ステップS13で、前記撮像手段1で生成された圧縮デジタル画像データを基に、前記CPU2は、デジタル画像信号に変換し、そのデジタル画像信号を前記表示手段3に供給して、撮像被写体像の画像を表示させる。【0031】このステップS13の前記表示手段3での撮像被写体像の画像が表示されると共に、前記CPU2は、撮像被写体像の画像を記憶する。前記表示手段3における画像表示開始時間の計測スタートを行う。

【0032】前記ステップS13の表示手段3による画像表示が開始されると、ステップS14で、CPU2は、前記撮像手段1で生成されたデジタル圧縮画像データを前記記憶手段4に記憶保持させる制御を行う。この記憶手段4へ画像データを記憶させる際には、記憶手段4内の画像データ記憶保存のアドレスデータ、及び記憶された画像データの消去、または消去不可等の符号データが共に記憶される。

【0033】前記ステップS14の記憶手段4への画像データの記憶が終了すると、ステップS15で、CPU2は、前記ステップS13で表示手段3に撮像画像を表示させた際にスタートさせたタイマーの経過時間を判定し、前記表示手段3に表示した撮像画像の表示が所定時間経過するまで表示時間の判定を行い、前記表示手段3の撮像画像の表示が所定時間経過すると、ステップS16で、CPU2は、前記表示手段3における撮像画像の表示駆動を停止させる制御を行い、ステップS17以降が実行される。

【0034】前記ステップS6、またはステップS10で、第1レリーズスイッチ（1R）がオフであると判定されたり、あるいは、前記ステップS16で、前記表示手段3における撮像画像の表示を終了させると、ステップS17でCPU2は、前記電源スイッチが前記ステップS1のイニシャライズ時のオン状態であるか判定する。このステップS17の電源スイッチのオン状態が確立されると、ステップS18でCPU2は、前記ステップS2でタイマースタートしてから事前設定されている所定の時間が経過されているか判定し、所定時間経過していない場合は、ステップS3に戻り、再度ストロボ発光チェックが実行され、継続して行われる被写体像の撮像動作が実行される。

【0035】前記ステップS17で電源スイッチがオフであると判定され、または前記ステップS18で、タイ

タリ値設定、及び前記撮像手段1の撮像素子の電子シャッタ秒端の駆動を行い、前記撮像手段1を駆動させて、前記撮像素子に発光させた被写体像の電子画像信号及び画像データの生成駆動を行う。

【0023】前記ステップS4で、第1レリーズスイッチ（1R）がオンされると判定されると、ステップS7で、CPU2は、図示していない測光機能を駆動させて、被写体画素を計測駆動させる。なお、測光機能は公知の測光計測方法が用いられ、前記撮像手段1の撮像素子で露光光電変換された被写体像信号から輝度値を演算する方法と、測光素子に入射された被写体光により生じる光電流を基に被写体輝度値を演算する方法がある。

【0024】前記ステップS7の測光動作が終了すると、ステップS8で、CPU2は、図示していない撮写手段までの距離を計測する公知の測距機能を駆動させて、被写体までの距離計測を行う。なお、測距機能は公知の測距計測方式の主として三角測量方式が用いられている。

【0025】この三角測量方式には、パッシブ方式とアクティブ方式とがあり、パッシブ方式は、被写体からの光を分離受光し、それぞれの被写体像信号に変換する一対のライセンサを有して構成されている。さらに、被写体の輝度やコントラストが低い場合に、当該被写体に向けて照明光を照射するストロボ等の補助光源を備えることもある。

【0026】また、上記アクティブ方式は、被写体に向けて赤外線ビーム光を投光する赤外線発光素子と、この赤外線発光素子と基線長をもって配置され、赤外線ビーム光が照射された被写体からの反射光を受光する位置検出素子とを有して構成されている。

【0027】前記ステップS8で、前述のパッシブ方式とアクティブ方式のいずれか、または両方式を組み合わせたハイブリット方式等の三測量での測距が終了すると、ステップS9で、CPU2は、第2レリーズスイッチ（2R）がオンされたと判定されると、第2レリーズスイッチ（2R）がオフであると判定されると、CPU2は、ステップS10で、再度第1レリーズスイッチ（1R）がオンされているか判定し、オンであると前記ステップS9に限り再度第2レリーズスイッチ（2R）のオン判定を行う。第1レリーズ（1R）がオフであると判定されると、ステップS17以降が実行される。

【0028】前記ステップS9で第2レリーズスイッチ（2R）がオンであると判定されると、前記CPU2は、ステップS11で、前記ステップS8で計測した測距値の基で、図示していない撮影光学系の焦点距離を駆動させて、撮影光学系を焦点位置に調整する。

【0029】次に、ステップS12で、CPU2は、前記撮像手段1を駆動制御して、前記ステップS7で測光した測光信号の基で、前記撮像手段1の撮像素子の感光時間、つまり電子シャッタを駆動制御して、撮像素子に露

動作を行う。

【0017】このステップS1のイニシャライズ動作が終了すると、ステップS2で、CPU2は、CPU2に内蔵されている図示していないタイマー機能をスタートさせて、経過時間を計測する。このタイマーは、タイマースタート後、所定時間の間に前記入力手段5の何らかのスイッチ操作がされたい場合に、前記電源手段7から供給される駆動電流を断電するために、電子撮像カメラを断電モードに設定するもので、前記入力手段5の何らかのスイッチが操作されると、速やかに電子撮像カメラを撮影可能状態に復帰可能とするスタンバイ状態とする。

【0018】前記ステップS2のタイマースタートが終了すると、前記CPU2は、図示していないストロボ発光用電源コンデンサの充電電荷をチェックするように、図示していない充電チェック機能を駆動させ、その充電チェック機能でチェックの結果、前記充電コンデンサの充電電荷が所定の電荷に満たない場合は、図示していない充電機能を駆動させて、充電動作を行う。

【0019】前記ステップS3で、充電コンデンサの充電電荷が所定の値である場合、または充電機能の駆動により、前記充電コンデンサが所定の値に充電されると、ステップS4で、前記CPU2は、前記入力手段5に設けられている図示していないズームアップまたはダウンスイッチが操作されたと判定する。

【0020】前記ステップS4で、ズームアップまたはダウンスイッチが操作されたと判定されると、前記CPダウンスイッチが操作されたと判定されると、前記CPU2は、図示していないズーム駆動機能を駆動制御して、ステップS5で、前記撮影光学系をズームアップまたはダウン駆動させる。つまり、ズームアップからズームダウンされると、前記撮影光学系を広角側から望遠側方向に繰り出すようにズーム駆動制御が実行され、ズームアップされると、前記撮影光学系を望遠側から広角側方向に繰り込むようにズーム駆動機能を駆動させる。

【0021】前記ステップS4でズームアップまたはダウンスイッチのいずれも操作されていないと判定された場合、または前記ステップS5のズーム駆動が終了すると、ステップS6で、前記入力手段5のレリーズスイッチがオンされると、判定する。

【0022】このレリーズスイッチは、2段回線操作可能なスイッチで、半押し状態で第1レリーズスイッチ（1R）がオンされ、全押し状態で第2レリーズスイッチ（2R）がオンする。この半押し状態の第1レリーズスイッチ（1R）がオンされると、CPU2は、図示していない被写体輝度を計測する測光機能と被写体までの距離を計測する測距機能を駆動制御する。また、全押し状態の第2レリーズスイッチ（2R）がオンされると、CPU2は、前記測距結果の基で図示していない撮影光学系の焦点距離と、前記測光結果の基で前記撮影光学系の

PU2の駆動制御の基で前記記憶手段4に記憶されている画像データを無線通信伝送する第一の無線通信手段6、及び前記撮像手段1、CPU2、表示手段3、及び第一の無線通信手段8を駆動する電流を供給する電源手段7からなっている。

【0010】この電子撮像カメラは、前記第一の無線通信手段6と無線通信可能な第二の無線通信手段9を有する外部駆動手段8と接続接続されるようになっている。

【0011】前記入力手段5は、前記撮像手段1を駆動して、被写体像を表示するレリーズスイッチ、前記撮像手段1に設けられている図示していない被写体光取り込み用の撮影光学系のレンズを電子撮像カメラ本体に比較させたり、視野位置から撮像可能な広角位置に繰り出し制御すると共に、前記電源手段7から撮像手段1、CPU2、表示手段3、及び第一の無線通信手段6に電圧供給のオン/オフする電源スイッチ、前記撮影光学系をズーム駆動するズームスイッチ、及び前記第一の無線通信手段6を介して、外部駆動手段8に画像データの伝送指示する画像データ自動伝送スイッチ等からなっている。

【0012】また、前記電源手段7には、電池が用いられ、前記入力手段5の電源スイッチがオフされた状態で、前記CPU2と第一の無線通信手段8には駆動電流が常時供給されるようになっている。

【0013】前記第一の無線通信手段8と第二の無線通信手段9は、携帯電話、PDA(Personal Digital Assistant)、ノート型パソコン、デジタルカメラ、プリンタ等の各種デジタル機器間を接続するBluetooth規格の通信方式で設定され、近距離無線通信方式であるBluetooth（登録商標）を採用した無線通信方式である。

【0014】また、前記外部駆動手段9は、ノート型パソコンを主体とする各種パソコンや、PDA等で、それらパソコンとPDAに前記Bluetooth（登録商標）が採用された第二の無線通信手段9を備えたものである。また、前記第二の無線通信手段9は、Bluetooth（登録商標）対応の携帯電話で、その携帯電話を介して、前記パソコンやPDA等にデータ伝送するようになっている。

【0015】このような構成の電子撮像カメラの撮像動作と撮像画像データの記憶等の撮像動作について図2を用いて説明する。

【0016】前記入力手段5の図示していない電源スイッチがオンされると、ステップS1で前記電源手段7から前記撮像手段1、CPU2、表示手段3、及び第一の無線通信手段8に駆動電流が供給されると共に、前記CPU2は、前記撮影光学系を電子撮像カメラの本体の視野位置に図示しない撮影光学系を電子撮像カメラの本体の視野位置から撮影可能な広角位置まで繰り出し駆動制御して、電子撮像カメラを撮像可能な状態とするイニシャライズ

マスタートから事前設定された所定の時間が経過されたと判定されると、ステップS19でCPU12は、電子撮像カメラの終了処理を行う。

[0036] このステップS19の終了処理は、前記撮影光学系をねじ位置へ繰り込み、かつ、前記電源手段7を制御して、前記電源手段1と表示手段3への駆動電源を供給を停止し、少なくとも前記CPU12で前記電源手段4に記憶されている画像データの読み出しと、その読み出した画像データを前記第1の無線通信手段6を用いて外部記憶手段8に伝送する機能を駆動する電源供給のみを行う。

[0037] 前記ステップS19の終了処理が終了すると、ステップS20で、CPU12は前記記憶手段4に記憶されている画像データの外部記憶手段8へ自動伝送を行うか否かを判定する前記入出力手段5に設けられている図示しない自動転送設定スイッチのオン/オフ状態判定を行う。

[0038] 前記自動転送設定スイッチが画像データの自動伝送を行うオンである、ステップS21で、CPU12は前記記憶手段4に記憶されている画像データを読み出し、前記第1の無線通信手段6を駆動制御して、前記外部記憶手段8の第2の無線通信手段9と無線通信を行い、画像データの転送動作を行う。なお、このステップS21の画像データの転送動作の詳細動作は後述する。

[0039] 前記ステップS20で前記自動転送設定スイッチが画像データの自動転送を行わないオフである、と判定されたり、または前記ステップS21の画像データの自動伝送が終了すると、ステップS22で、前記電子撮像カメラをHal t(停止)状態にする。

[0040] このHal t状態は、前記第1の無線通信手段6が前記第2の無線通信手段9からの画像データ転送要求信号を受信可能で、かつ、前記第2の無線通信手段9から画像データ転送要求信号を受信すると、前記CPU12が前記記憶手段4から画像データを読み出し、かつ、前記第1の無線通信手段6を駆動制御して画像データを転送させる動作に変わるスタンバイ状態である。

[0041] 前記ステップS22のHal t状態で、前記外部記憶手段8が第2の無線通信手段9を駆動させて、画像データ転送要求信号を送信し、前記第1の無線通信手段6が画像データ転送要求信号を受信して、その受信情報を前記CPU12に伝送されると、ステップS29で、前記CPU12は、前記画像データ転送要求を前記第1の無線通信手段6が受信したか判定され、前記記憶手段4に記憶されている画像データ転送要求信号を受信すると、ステップS24で、CPU12は前記入出力手段5の自動転送設定スイッチが自動伝送するオンであるか判定し、自動転送するオンであると判定されると、前記ステップS21に戻り、画像データ転送動作が実行される。

[0042] 前記ステップS23で、CPU12が前記第

2の無線通信手段9からの画像データ転送要求信号が受信されていないと判定されると、前記ステップS1に戻り、電子撮像カメラの電源スイッチがオフされた撮影不可状態となり、ステップS1のインシャイズのスタンバイ状態となる。

[0043] また、前記ステップS24で、CPU12で前記自動転送設定スイッチが自動転送を行わないオフであると判定されると、前記ステップS22に戻り、Hal t状態に設定する。

[0044] つまり、電子撮像カメラの電源スイッチがオンされて、ステップS1～S16の電子撮像の動作に従い撮像手段1で電子撮像され、その電子撮像された記憶手段4に記憶された画像データは、撮像動作が終了して、電子撮像カメラの電源スイッチがオフとなると、画像データの自動転送スイッチがオンされていると、電子撮像された画像データは自動的に電子撮像カメラから外部記憶手段8に第1の無線通信手段6を用いて前記外部記憶手段8の第2無線通信手段9との間で無線通信伝送する。また、電子撮像カメラの電源スイッチがオフ後、外部記憶手段8からの画像データ転送要求により転送可能とした。

[0045] 次に、前記ステップS21の画像データ転送の詳細動作について図3を用いて説明する。ステップS25で、CPU12は前記記憶手段4に未転送画像データが記憶されているかチェックし、未転送画像データはないと判定されると、リターンを介して、前記ステップS22のHal t状態が実行され、未転送画像データがあると判定されると、ステップS26で前記外部記憶手段8の第2の無線通信手段9からの画像データ転送要求信号を前記第1の無線通信手段6が受信したかCPU12で判定される。

[0046] 前記ステップS26で、前記第1の無線通信手段6は前記第2の無線通信手段9からの画像データ転送要求信号を受信していないと判定されると、ステップS27で、CPU12は第1の無線通信手段6をマスタートとして、前記記憶手段4に記憶されている画像データを前記第2の無線通信手段9を介して前記外部記憶手段8に画像データ転送する準備動作させ、ステップS28で前記第1の無線通信手段8を駆動させて、前記第2の無線通信手段9と無線通信するための要求信号を発信する。

[0047] 前記第1の無線通信手段9から画像データ転送要求信号を第2の無線通信手段9が受信すると、この第2の無線通信手段9で受信した画像データ転送要求信号に対して、前記外部記憶手段8は画像データ転送受け入れ可能か、または受け入れ準備ができているか判定し、画像データ受け入れ可能であると前記外部記憶手段8は、第2の無線通信手段9を駆動制御して、前記第1の無線通信手段6に対して、画像データ受け入れ必要信号を出力する。

いて、かつ、前記ステップS31とS34で転送通信された画像データを前記記憶手段4からの消去禁止または消去禁止警告表示等の設定を解除させる。

[0056] 次に、ステップS37でCPU12は前記記憶手段4に記憶されている画像データ毎に自動消去可能か判定する。この自動消去の判定は、前記ステップS37で消去禁止と消去禁止警告表示等の設定が解除され、自動消去が有効であるか、また、前記ステップS36で消去禁止または消去禁止警告表示が設定されて、自動消去を無効としているかである。

[0057] 前記ステップS37で自動消去が有効であると判定されると、ステップS38でCPU12は前記記憶手段4に記憶され、かつ、前記ステップS31またはS34で転送通信し、前記ステップS32またはS35で転送通信エラーがないと判定され、さらに、前記ステップS33で消去禁止または消去禁止警告表示の設定が解除された画像データを消去する。

[0058] 前記ステップS37で自動消去が無効であるか判定されると、前記記憶手段4に記憶され、かつ、前記ステップS31またはS34で転送通信し、前記ステップS32またはS35で転送通信エラーが生じたと判定され、さらに、前記ステップS36で消去禁止または消去禁止警告表示が設定された画像データを消去せず残存させる。

[0059] 前記ステップS37で自動消去が無効と判定されたり、または自動消去が有効と判定され、ステップS38で自動消去が許可された画像データの消去が終了すると、リターンを介して、前記ステップS22のHal t状態が実行される。

[0060] つまり、前記電子撮像カメラが撮影動作を終了して、入出力手段5の電源スイッチがオフされると、電源手段7からは、CPU12と第1の無線通信手段6にのみ駆動電源を供給して駆動動作させている。この電源スイッチのオフ状態になると、CPU12は記憶手段4に記憶されている画像データ(すなわち、過去の画像データ)を送らない画像データが生じて、消去されない画像データ転送時に、転送エラーが生じて、消去されない画像データ、及び新たに記憶された画像データがあるか判定し、未転送画像データがあると、CPU12は外部記憶手段8に対して画像データ転送要求を行い、外部記憶手段8から転送受け入れ許可が得られると記憶手段4の記憶されている未転送画像データを転送通信を行う。

[0061] また、電子撮像カメラの電源スイッチがオフ状態で、かつ、記憶手段4に未転送画像データがある場合に、外部記憶手段8から画像データ転送要求がある、と、電子撮像カメラのCPU12は、記憶手段4に記憶されている未転送画像データを外部記憶手段8に転送通信する。

[0062] このようにして、外部記憶手段8に転送通信

供された画像データは、配線手段4から自動消去することとで、配線手段4に新たな画像データの配線が可能となる。

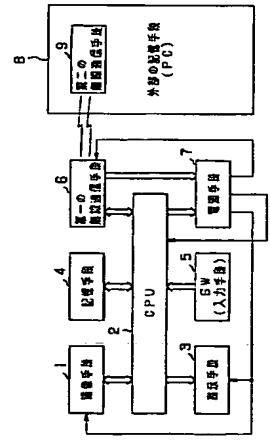
【0063】さらに、外部配線手段8をBluetooth (登録商標) 対応の携帯電話またはPDA等の組合は、電子撮像カメラの第1の無線通信手段6と前記携帯電話またはPDAを接続して、その携帯電話とPDAを介して、パーソナルコンピュータに画像データ転送を行うことも可能である。

【0064】

【発明の効果】本発明の電子撮像カメラによると、配線手段に記憶されている画像データを無線通信手段を用いて外部記憶装置に無線通信手段で送り、無線通信手段で送った電子画像データは配線手段から消去することにより、配線手段の記憶容量を余裕のある状態にすることが可能となり、また、電子カメラの小型化が維持できる。

【図面の簡単な説明】

【図1】



【図1】本発明に係る電子撮像カメラの一実施の形態の構成を示すブロック図。

【図2】本発明の係る電子撮像カメラの画像動作を説明するフローチャート。

【図3】本発明に係る電子撮像カメラの電子画像データの伝送動作を説明するフローチャート。

- 【符号の説明】
- 1…撮像手段
 - 2…マイクロプロセッサ (CPU)
 - 3…表示手段
 - 4…配線手段
 - 5…入力手段
 - 6…第1の無線通信手段
 - 7…電源手段
 - 8…外部記憶手段
 - 9…第2の無線通信手段

【図2】

